AGENCY FOR HEALTHCARE RESEARCH AND QUALITY

AHRQ Quality Indicators Software: v2022 ICD-10-CM/PCS

August 2022

Announcements

- This webinar will be recorded and available on the AHRQ QI website - https://qualityindicators.ahrq.gov/.
- Due to the large number of attendees, all participant lines will remain in listen-only mode.
- You may submit questions via the ***chat feature*** at any time; however, questions will be answered only during the Q&A session.
- For any **technical difficulties**, please contact **Megan Lee** at **mlee@panth.com.**

Agenda

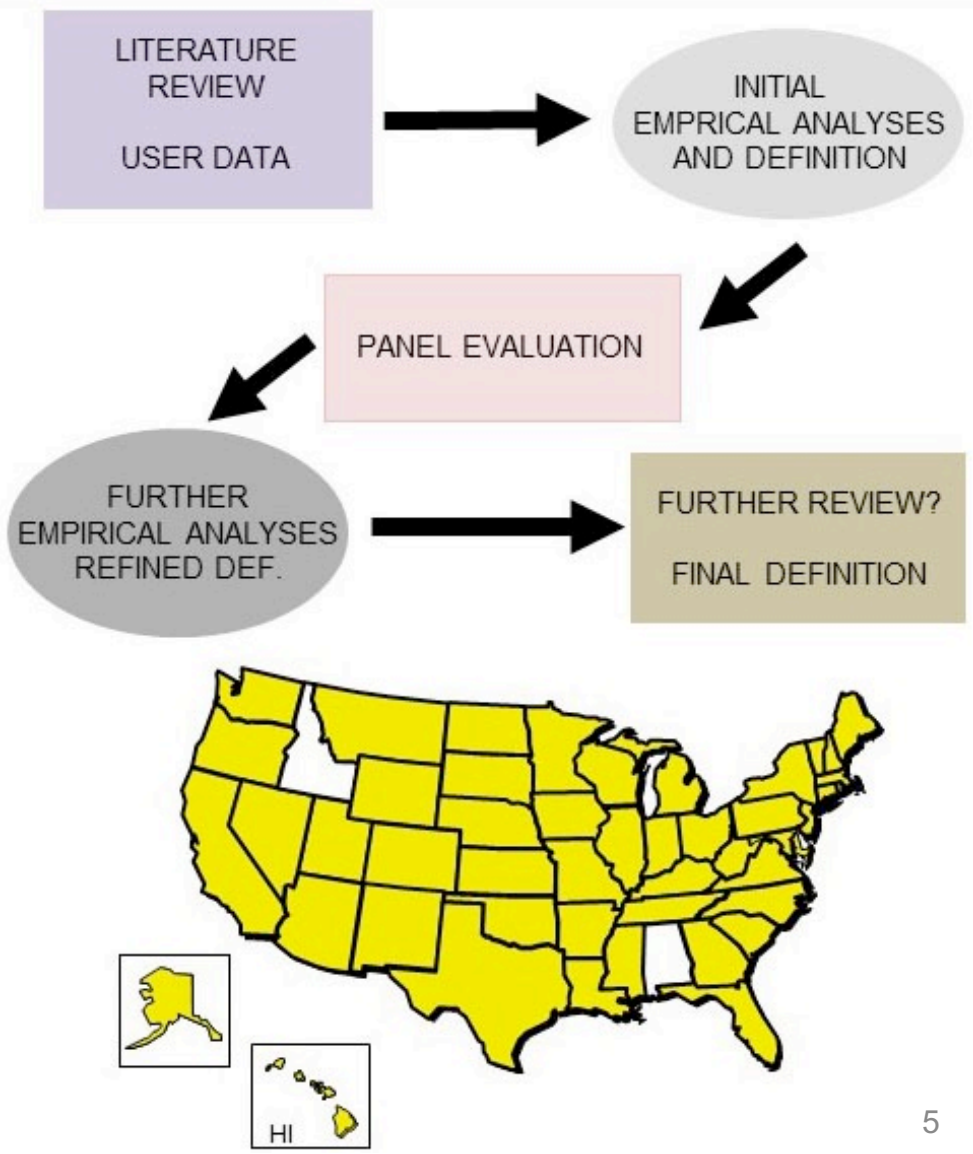
- Overview of the AHRQ QIs
- Overview of v2022 Software and Improvements
- Usability/Software Improvements
- Highlights of Indicator Changes
- v2022 SAS and WinQI Software Resources
- Q&A/Discussion

Today's Speakers

- **Jennifer Newburg***, Project Manager, Pantheon
- **CDR Karen Ho Chaves**, US Public Health Service Commissioned Corps; Director, Division of Quality Measurement and Improvement, Center for Quality Improvement and Patient Safety (AHRQ)
- **Alex Bohl**, Project Director, Hospital Quality Indicators Project, Mathematica
- **Veronica Hernandez**, Data Scientist, IBM
- **Vivek Kumar**, Project Director, AHRQ QI Project, Pantheon

Origins of AHRQ Quality Indicators

- Developed initially at the request of state organizations and hospital associations as a quality improvement tool
- Based on evaluation methodologies developed in the AHRQ Evidence-based Practice Centers (EPC)
- Developed and tested using all-payer Healthcare Cost and Utilization Project (HCUP) data in 47 States



AHRQ QIs Today

- **Used for**
  - Quality monitoring and improvement
  - Public reporting
  - Needs assessments, planning, research, and informing policy
  - Some used for performance-based payment programs
- **Broad Applicability**
  - 65+ measures cover broad range of conditions, procedures, and populations
- **Ready-to-use**
  - Readily-available administrative data
- **Actionable**
  - Provides real-time information
  - Provides national rates for comparison

Hallmarks of AHRQ QIs: Ensuring Quality

- Continuous Quality Improvement
  - Reviews of research evidence
  - Rigorous empirical testing
  - Annual updates to align coding changes
  - Expert panels and standing workgroups
  - User feedback
- Transparency
  - Technical specifications, documentation, and software (WinQI, SAS) are free to the public
  - Open source
  - Improved over time based on public and private input

AHRQ QI Modules

Prevention (PQIs)

- Potentially preventable hospital admissions rates for ambulatory care conditions
- Area-level indicators
- Risk-adjusted

Inpatient (IQIs)

- Quality of care inside the hospital—hospital-level indicators
- Mortality rates for adult conditions / surgical procedures
- Risk-adjusted

Patient Safety (PSIs)

- Potentially avoidable complications and adverse event rates following adult surgeries / procedures performed in the hospital
- Hospital-level indicators
- Risk-adjusted

Pediatric (PDIs)

- Mortality rates for pediatric surgical procedures
- Potentially avoidable complications and adverse event rates in the hospital
- Potentially preventable hospitalization rates
- Hospital-level and area-level indicators
- Risk-adjusted

About the AHRQ QI Software

- Uses readily available administrative data
  - Risk-adjusted in the v2022 QI software
- Compatible with two commonly used platforms – SAS and Windows
- Available from AHRQ at no cost to the user
- Updated on an annual basis

Learn more about software features:
WinQI Software Instructions Document
SAS QI Software Instructions Document

v2022 Software Release

SAS July 2022

- **Now available:** v2022 software
- Separate software package to download for each module

WinQI July 2022

- **Now available:** v2022 software
- Download a single installer package for all four modules

Software available at:
https://qualityindicators.ahrq.gov/Software/Default.aspx

Overview of v2022 Software and Improvements

Fiscal Year (FY) 2022 Coding Updates

- Implemented FY22 coding updates, which impact all software modules
  - Based on FY22 ICD-10-CM/PCS
    - Compatible with ICD-10-CM/PCS hospital data for FY16 – FY22
  - CMS Medicare Severity-Diagnosis Related Groups (MS-DRG)
  - Present on Admission Exempt List
  - HCUP FY22 Tools: Elixhauser Comorbidity Software Refined, Clinical Classifications for Diagnosis and Procedures, Procedure Classes
  - Operating room procedure codes (adapted with surgical review to ensure consistency by approach; e.g., open, percutaneous endoscopic)
- HCUP 2019 SID data used for reference population (and risk adjustment) for v2022

Version 2022 Updates

- Software implements specification and programming changes across all modules.
  - Developed through a detailed deliberation and assessment process with clinicians and expert coders
- Software continues to provide options for excluding COVID-19 discharges.
- Removed Limited APR-DRG grouper from IQI
- Now includes hospital-level composite text file (SAS) and report (WinQI) for PSI and IQI
- Changes will be detailed in the Release Notes for each AHRQ QI module, available at:
  - https://qualityindicators.ahrq.gov/Software/SAS.aspx

v2022 Indicator Logic Changes

- Overall
  - Removed Major Diagnostic Category (MDC) imputation logic
    - **Reminder:** Users must supply MDC to calculate risk-adjusted rates.
  - Implemented a global discharge-level exclusion for missing MDC
  - No “substantive” changes from a regulatory perspective
- IQI
  - No significant changes to report
- PDI
  - Removed denominator exclusion contingencies on numerator-defining diagnoses for PDI 08
  - Changed PDI 09 logic to identify last occurrence of prolonged mechanical ventilation or intubation instead of first, and slightly narrowed denominator exclusion to limit to neurologic disorders POA

v2022 Indicator Logic Changes (cont.)

- PQI
  - No significant changes to report
- PSI refinements and corrections:
  - Implemented PSI 03 site-specific exclusion logic
  - Removed denominator exclusion contingencies on numerator-defining diagnoses for PSI 09 and 14 (SAS clean-up)
  - Changed PSI 11 logic to identify last occurrence of prolonged mechanical ventilation or intubation instead of first, and slightly narrowed denominator exclusion to limit to neurologic disorders POA
  - Changed PSI 14 logic to identify last occurrence of reclosure instead of first, and to omit zero-risk percutaneous procedures

Summary of v2022 Data Issues

- v2022 Reference Population Rates
  - 2019 HCUP State Inpatient Databases (limitations)
    - Colorado and Hawaii excluded from reference population for certain indicators requiring age in days
    - New Hampshire, Oklahoma, and Wisconsin excluded from reference population for indicators requiring procedure date
    - Delaware, Connecticut, and Wyoming did not report POA.
  - Numerators, denominators, and observed rates only
- Default set to exclude records with missing MDC
- Default set to exclude records with COVID-19
- Excludes records with missing procedure dates from PSI 15 denominator

Population File Updates

- Updated **QI population file** intercensal and postcensal estimates of county-level populations from years 2000 – 2021 for use with area-level QIs
- Population categories:
  - Single-year age group
  - Sex
  - Race
  - Hispanic origin
- Details about the population methodology:
  - https://qualityindicators.ahrq.gov/Downloads/Software/SAS/V2022/AHRQ_QI_v2022_ICD10_Population_File.pdf

Observed (relative) rate changes from v2021 to v2022

- **Compared to v2021 expected changes in observed rates:**

Patient Safety Indicators (PSIs)
• Increase in PSI 11 rates (+8%) due to “last date” logic and slightly narrower denominator exclusion • Increase in PSI 14 rates (+78%) due to “last date” logic and exclusion of zero-risk percutaneous procedures from denominator (but numerator impact is <10%) • Decrease in PSI 02 rates (-10%) due to denominator updates • Minimal increase (+1%) in rate of PSI 09 due to exclusion of zero-risk records from denominator • Slight decreases in rates of 12 (-1%), 13 (-1%), and 15 (-1%) due to added codes in denominator exclusions • No other notable changes.

Note: v2021 software was applied to HCUP 2019 data as the baseline. Then v2022 software was applied to HCUP 2019 data to compare with the baseline PSI rates based on 48 states + DC for HCUP all-payer 2019 data.

Observed Rate Changes (cont.)

Prevention (PQIs)	Inpatient (IQIs)	Pediatric (PDIs)
• Stable rates in most PQIs	• Stable rates in most IQIs	• Area-level PDIs have stable rates. • Slight increase in PDI 09 rates due to “last date” logic and slightly narrower denominator exclusion • Minimal increase in rate of PDI 08 due to exclusion of zero-risk records from denominator

Methodological Refinements to Risk Adjustment

- Risk adjustment: annual updates and maintenance
  - Updated data: 2019 versus 2018 HCUP SID
  - Changes to specification and risk factors due to fiscal year updates
  - New variable selection method used for v2022 to optimize number of features and generalizability
    - Least absolute shrinkage operator, LASSO, in R (vs. SAS)
    - Independent working correlation matrix (vs. exchangeable)
  - Improved PSI 13 and PDI 10 models with variables for high-risk and intermediate-risk immune compromising conditions
  - Improved PSI 15 model with variables based on counting minor and major diagnostic procedures and minor and major therapeutic procedures

Risk Adjustment (cont.)

- Other notable changes:
  - AHRQ Clinical Classifications Software Refined (CCSR) for ICD-10-PCS Procedures HCUP tool added to IQI
    - CCSRs replace APR-DRGs for IQI procedure-based measures.
    - PRCCSR procedures occur before measure-specific procedures and depend on PRDAY.
  - Added risk factor for Do Not Resuscitate (DNR) that is POA to IQI mortality indicators

Usability/Software Improvements

User Options/Software Updates

- Certain user options suppress expected, risk-adjusted, smoothed, and composite rates.

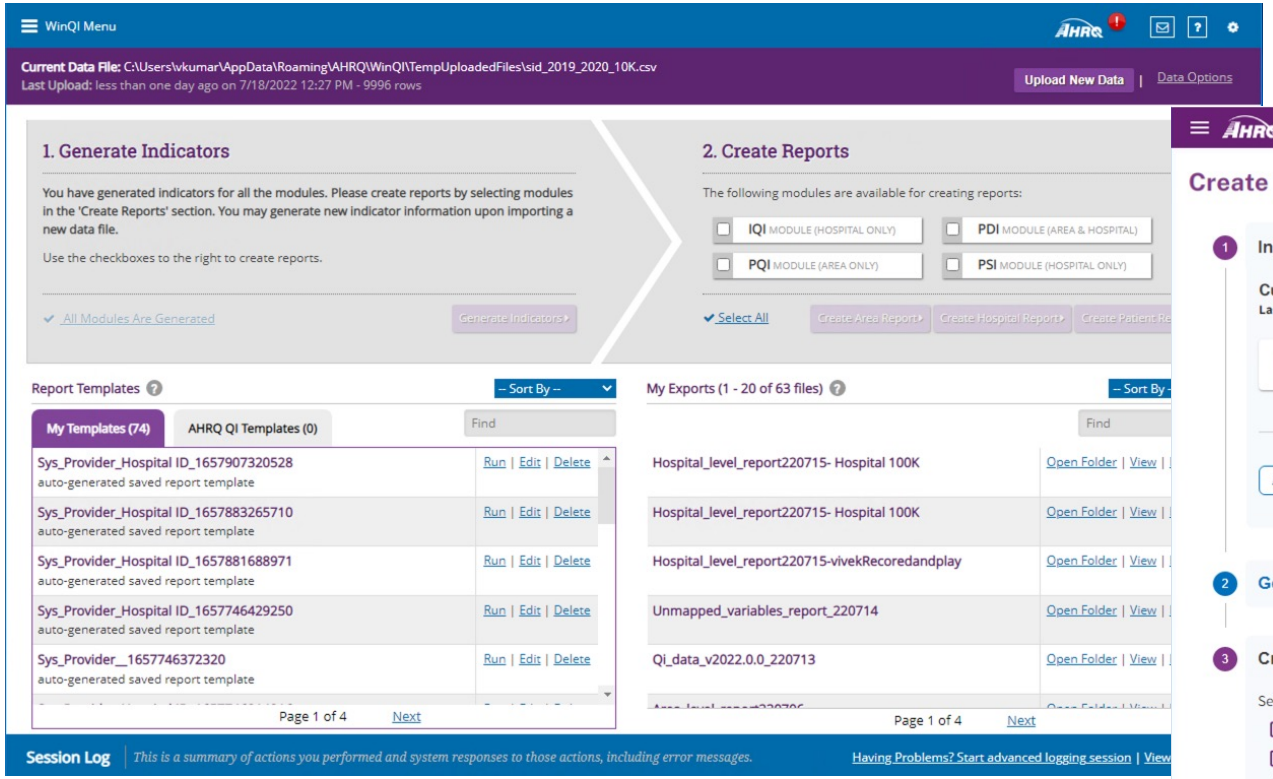
User Option	Software Updates	Rationale
Procedure Day (PRDAY)	If procedure day is not included in the input data, the software output would only include numerators, denominators, and observed rates for PSI 04, 09, 10, 11, 12, 14 and 15, and PDI 08 and 09. PRDAY is required for IQIs.	There is no related logic to handle cases when procedure day is missing for PSI and PDIs. For IQIs, PRDAY is used to define variables used in risk adjustment.
Major Diagnosis Category (MDC_PROVIDED)	If MDC is not supplied on input data, the output includes only numerators, denominators, and observed rates for PSIs and IQIs. If users indicate MDC is provided but the field is not populated, the software terminates. Records with missing MDC are deleted.	Users are required to provide MDC in their input data for accurate indicator calculation. In v2022, we ask users to specify whether MDC is included in the control program as calculated by the CMS MS-DRG grouper. MDC must be a valid value between 1-25 and not mapped from MS-DRG.
Stratification (TYPELVLH)	If users choose certain stratification options (age, sex, age in days, birthweight), software output includes only numerators, denominators, and observed rates.	It is inappropriate to produce risk-adjusted rates for stratum using age, sex, age in days, and birthweight because these are used in risk adjustment.

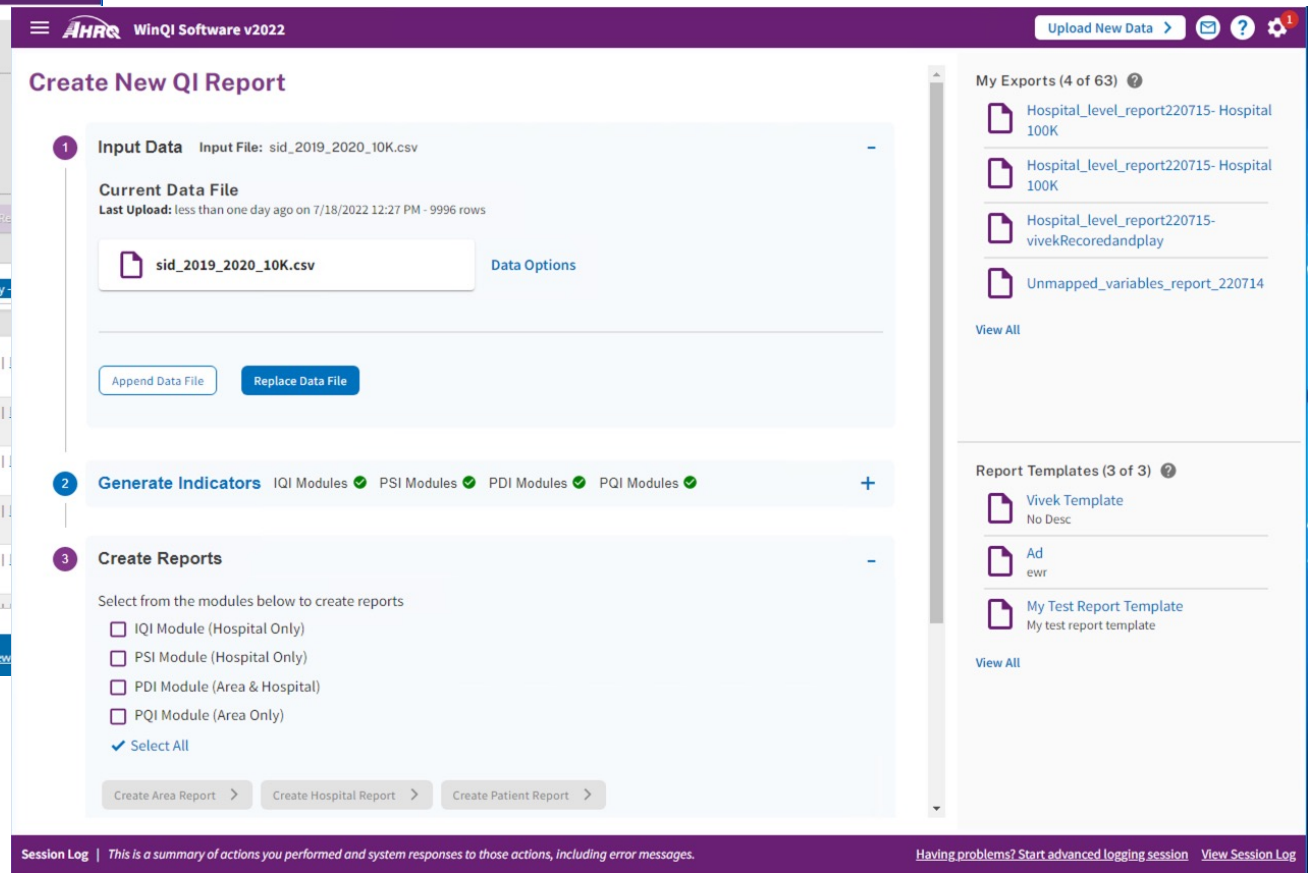
User Suggestions Help Improve the QIs

- Reviewed and expanded list of operating room procedure codes (ORPROC)
  - Indicators Impacted:
    - PDI: NQI 03, PDI 08, PDI 09, PDI 10
    - PSI: PSI 04, PSI 08, PSI 09, PSI 10, PSI 11, PSI 12, PSI 13
- Code lists reviewed, added, and removed for consistency with clinical intent and exploit clarity provided by ICD-10-CM/PCS. For example,
  - User-suggested correction to remove 3 codes from PSI 15 numerator (TECHNI15D) to avoid false positives
  - User-suggested corrections to add selected codes to PSI 06 (CARDSIP), PSI 12 (THROMP, NEURTRAD), and PSI 13 (INFECID) denominator exclusions to avoid false positives
  - Users identified additional procedures that are potentially performed via the trans-pleural route (CARDSIP) and are therefore expected to cause small pneumothoraxes (PDI 05)
- Users requested insight into PSI 90 calculations leading to composite report refinements

v2022 WinQI Software Changes / Improvements

WinQI v2022 – UI and UX Redesigned

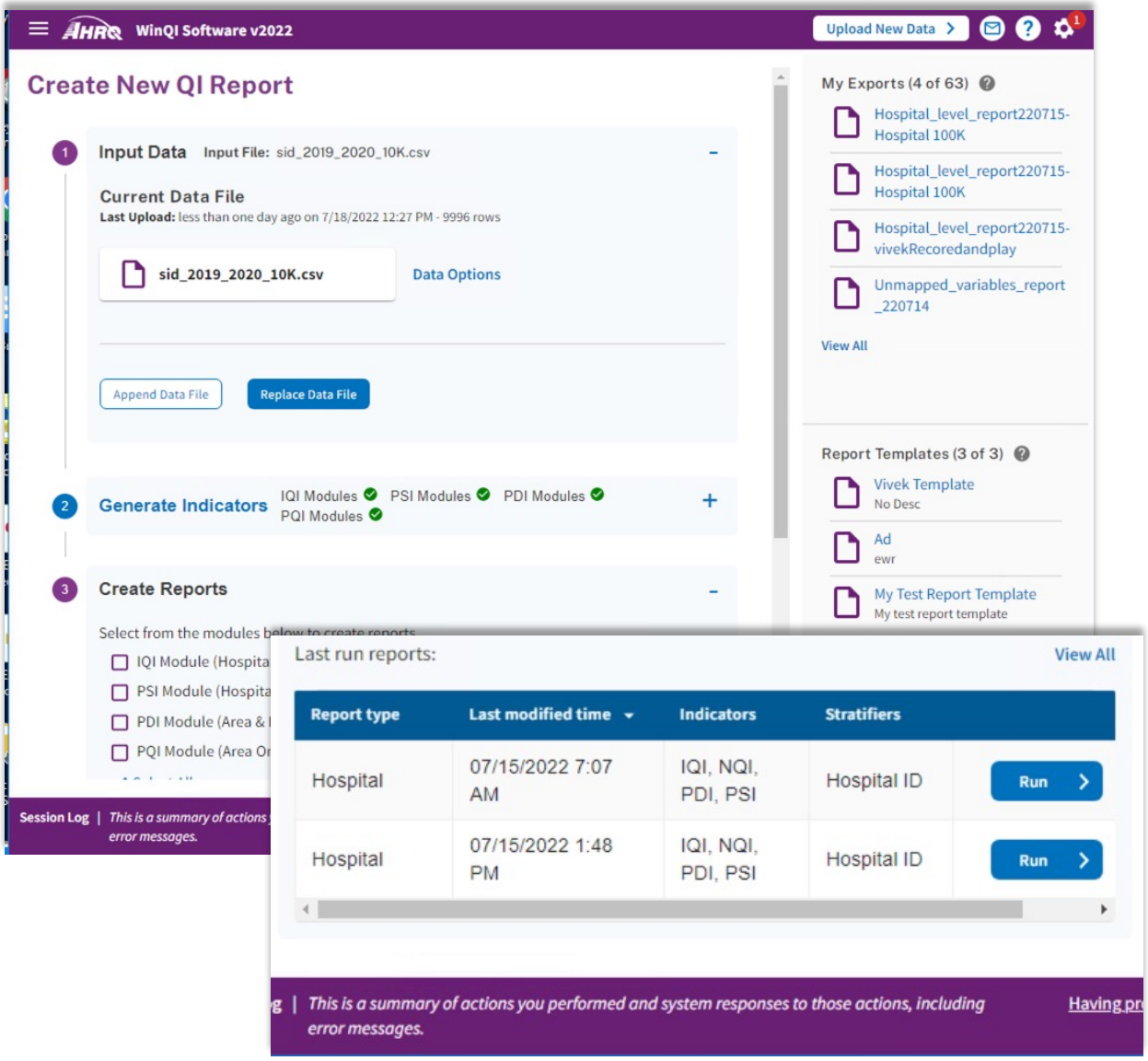




Common UI elements are used to make screens look modern and consistent across the entire application.

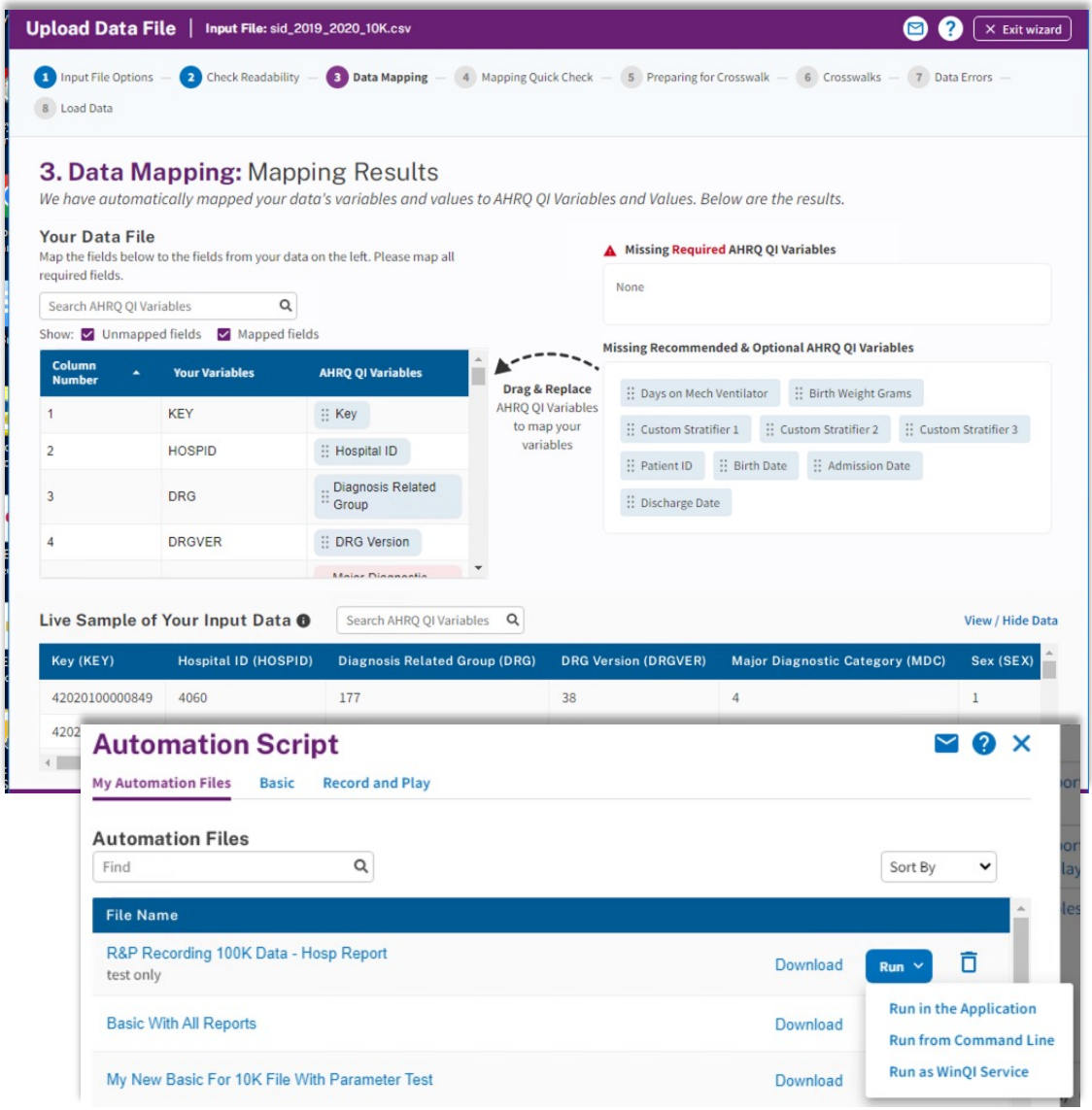
v2022 WinQI Software Changes / Improvements – Cont.

- Support for FY22 code updates
- On the home screen, the layout has been significantly changed to represent the process workflow explicitly and intuitively for users.
- The input data files can now be uploaded by dragging and dropping them.
- A new section added on the home screen shows last-run reports so users can quickly and easily re-run reports if needed.



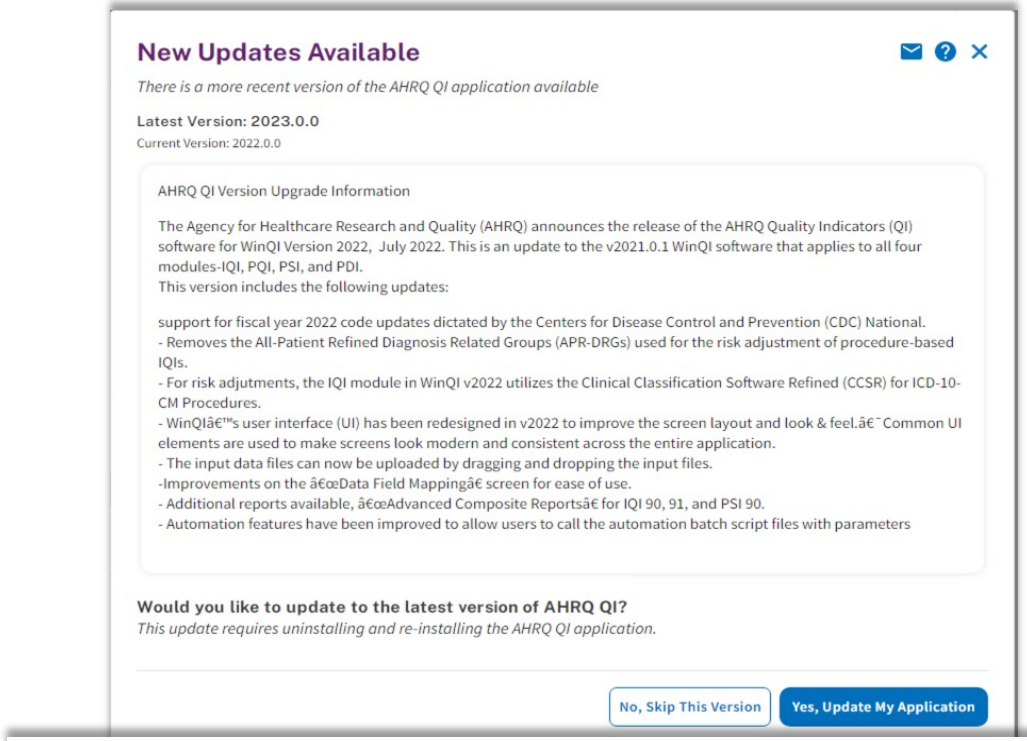
v2022 WinQI Software Changes / Improvements – Cont.

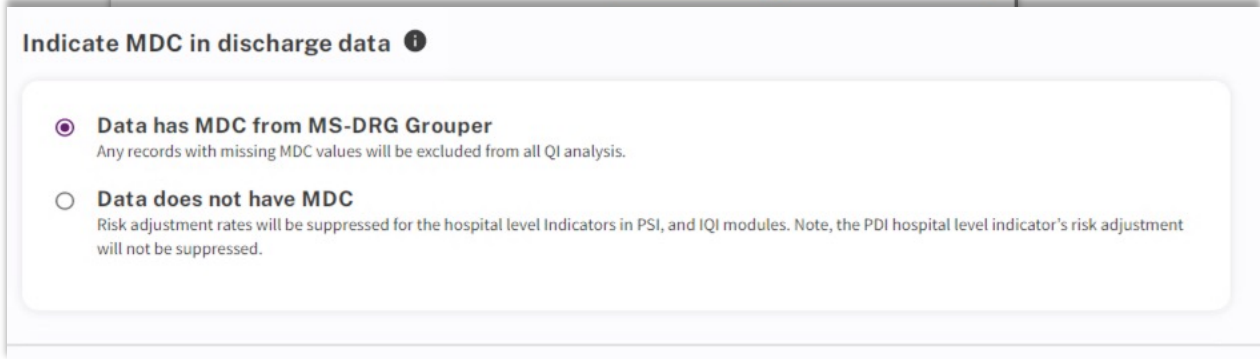
- On the input data import process wizard, the “Data Field Mapping” screen layout is updated.
- Users can now view additional reports, “Advanced Composite Reports” for IQI 90, 91, and PSI 90. This allows users to better understand the components used in the composite calculation.
- Automation features have been improved to allow users to call the automation batch script files with parameters.
- Users can also now initiate the command line automation batch calls from within the application.



v2022 WinQI Software Changes / Improvements – Cont.

- Removes the APR-DRG Grouper component
- Impact of MDC on measure calculation and risk-adjustment suppression based on the information provided by the user
- The software will notify users of all software updates. By accepting the v2022 update, it will automatically uninstall the prior version and install v2022.





Highlights of Indicator Changes

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Prevention (PQIs)

Annual coding updates: PQI 07, 08, 11, 12, 14, 15, 16, 90, 91, 92, 93

- Other updates: PQI 07, 08, 11, 12, 14, 15, 16, 90, 91, 92, 93

Inpatient (IQIs)

- Annual coding updates: IQI 20
- Other updates: IQI 08, 09, 11, 12, 15, 16, 17, 18, 19, 20, 21, 22, 30, 31, 33, 90, 91

Patient Safety (PSIs)

- Annual coding updates: PSI 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 18, 19, 90
- Other updates: PSI 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 18, 19, 90

Pediatric (PDIs)

- Annual coding updates: NQI 03, PDI 01, 05, 08, 09, 10, 12, 14, 15, 16, 18, 90, 91, 92
- Other updates: NQI 03, PDI 01, 05, 08, 09, 10, 12, 14, 15, 16, 18, 90, 91, 92

Specification Changes

- Software implements specification and programming changes across all modules.
  - Developed through a detailed deliberation and assessment process with clinicians and expert coders

- Changes are detailed in the Change Log Documents for each AHRQ QI module
  - Log of Updates
  - Annual fiscal year ICD-10-CM/PCS coding revisions
  - All ICD-10-CM/PCS coding revisions in MS Excel format
  - Available at:
    - PQI: https://qualityindicators.ahrq.gov/Modules/Log_Coding_Updates_PQI_v2022.aspx
    - IQI: https://qualityindicators.ahrq.gov/Modules/Log_Coding_Updates_IQI_v2022.aspx
    - PSI: https://qualityindicators.ahrq.gov/Modules/Log_Coding_Updates_PSI_v2022.aspx
    - PDI: https://qualityindicators.ahrq.gov/Modules/Log_Coding_Updates_PDI_v2022.aspx

AHRQ QI Software Resources

- **AHRQ QI technical assistance**
  - https://qualityindicators.ahrq.gov/FAQs_Support/
  - QIsupport@ahrq.hhs.gov

- **AHRQ QI v2022 software and documentation**
  - https://qualityindicators.ahrq.gov/Software/Default.aspx

Q&A/Discussion

Thank You

Thank you to our speakers and participants!

General Questions and Comments:

AHRQ QI Support Team

QIsupport@ahrq.hhs.gov

AHRQ QI Website

https://qualityindicators.ahrq.gov/